

*Citation for published version:*

Codinhoto, R, Boyko, C, Cooper, R, Tzortzopoulos, P & Kagioglou, M 2009, 'The Physical Environment and Wellbeing: Looking Ahead', Paper presented at International Built & Human Environment Research Week 2009, Salford, UK United Kingdom, 29/01/09 - 30/01/09.

*Publication date:*  
2009

*Document Version*  
Peer reviewed version

[Link to publication](#)

**University of Bath**

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# **The Physical Environment and Wellbeing: Looking Ahead**

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## **Abstract:**

There are several sources of evidence demonstrating that the physical environment impacts directly and indirectly in our lives. Both positive and negative impacts of the physical environment have been observed in our health and wellbeing. Thus, to understand this relationship is crucial to prevent negative impacts and accelerate positive ones. In this regard, this paper presents a summary of the research findings of two research projects looking into the links between environment and wellbeing. The purpose of this paper is to present evidence about the impacts of the physical environment on wellbeing as well as trends related to the physical environment so that future scenarios can be explored. The research method used was an extensive literature review. Additionally, a workshop was organised in order to better understand the major trends and related drivers in the physical environment that could impact wellbeing over the next 20 years. Research findings demonstrate that there is a considerable amount of evidence linking the physical environment to wellbeing despite the lack of clarity in relation to cause-effect relationships. Moreover, 10 trends and drivers related to the physical environment were identified and considered as impacting on wellbeing.

## **Keywords:**

Physical Environment, Wellbeing, Trends

## **1. Introduction**

In our daily lives we have to cope with myriad stressor factors that without control may impact on our performance and wellbeing. In this regards, the physical environment may play a key role in triggering, directly or indirectly, those stressors.

Several studies demonstrate how aspects of the physical environment impact on our mental wellbeing. Such studies are explained by myriad theories that relate the physical environment to human reactions. The environmental load theory (Cohen, 1978) is one example. According to Cohen (1978) humans only cope with selective attention, i.e. in stressful situations, humans tend to ignore low priority inputs. Cohen (1978) explains that this is due to our limited capacity for processing information. The environment load theory is only one of the existing theories and the boundaries of this research area are enormous including different environments and scales of

observation such as the natural environment (e.g. Wells & Evans, 2003 and De Vries et al., 2003), the urban environment (e.g. Cohen-Mansfield & Werner, 1998, 1999), housing (e.g. Oswald et al., 2007), and learning environment (e.g. Duker and Rasing, 1989). Although evidence about the relationship between the physical environment and wellbeing is abundant, current changes in the physical environment may impact on our wellbeing to an unknown extent. Therefore, this paper aims to present a set of UK trends and drivers related to the physical environment and to discuss, based on the available evidence, how predicted changes in the physical environment may impact on our mental wellbeing.

The research strategy adopted to identify the impacts of the physical environment on mental wellbeing was a literature review. The review undertaken was both multi-disciplinary in focus (i.e. covering the natural, social, physical and health sciences) and diverse in scale (i.e. from the small-scale environment, such as hospital bedrooms and office spaces, to the large-scale environment, for instance, urban, neighbourhood and rural area).

In the context of the trends and drivers occurring in the physical environment a one day workshop was organised in order to better understand the major trends and related drivers in the physical environment that could impact mental wellbeing. Thirteen UK experts attended the workshop, including academics and practitioners in architecture, urban planning, development, finance, healthcare and education.

The research findings presented in this paper are part of two years research project about the impact of the built environment on health outcomes and a one year foresight research project looking into factors impacting on mental capital and wellbeing. In section one, evidence linking the physical environment to wellbeing is presented. Section two, a list containing ten trends and drivers in the physical environment and their impacts on wellbeing is presented. A discussion about the investigation is presented in section three. Conclusions are presented in section four.

## **2. Physical Environment and Wellbeing: Scientific Evidence**

Health can be broadly defined as a “state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity” (WHO, 1946). This broad definition can be deployed into several health-related measures such as wellbeing and health related quality of life (HRQL). As argued by Wilson and Cleary (1995) wellbeing as well as HRQL can be differentiated from the concept of health, although these concepts are extremely related to each other. Therefore, in this research, wellbeing includes measures of health and HRQL.

The impact of the physical environment on wellbeing has been broadly investigated. Cooper et al. (2008) argue that the existing physical environment stressor factors can be related to three main groups including: the quality of the fabric of the built

environment, the quality of the ambient environment and psychological impacts of the physical and ambient environment. These characteristics are further described below. Note that the list of studies presented is not exhaustive and more studies can be found in Codinhoto et al. (2008) and Cooper et al. (2008).

### ***2.1. The quality of the fabric of the physical environment***

The quality of the fabric of the physical environment includes the design and construction of buildings, the spaces between buildings (e.g. parks) and associated infrastructure as well as the maintenance and regeneration of spaces and places which can be viewed at different scales, from urban to site scale (Cooper et al., 2008). Examples of studies in this area include:

- Men living in multiple-family versus single-family housing (Edwards et al., 1982);
- Women living in maisonettes, high-rise or low-rise flats (Richman, 1974) versus women living in houses (Richman, 1974; 1977);
- Children living in flats, particularly in poorer housing areas, versus children living, for example, in houses with gardens (Ineichen & Hooper, 1974; Richman, 1977; Saegert, 1982; Blackman et al., 1989);
- Elderly residents living in high-rise dwellings versus those living in detached homes in the community (Husaini et al., 1991) or living in flats with a garden (Devlin, 1980).
- Individuals living in poorer-quality dwellings or neighbourhoods as an added source of stress (Kearns et al., 1992; Kearns & Smith, 1993; Smith et al., 1993; Dunn, 2000).

### ***2.2. The quality of the ambient environment***

The quality of the ambient environment includes, for instance, acoustics, lighting and air quality, as well as temperature, colour, ventilation, humidity, access to nature and to natural sunlight (Cooper et al., 2008). Examples of studies in this area include:

- Goldstein (1990) studies relating ventilation and indoor lighting (natural and artificial) with health and safety, and also with efficient productive activity and social and intellectual development.
- Dwelling with more natural residential settings nearby also increases the levels of cognitive functioning in children (Wells & Evans, 2003).

- Having a space in which to retreat in nature buffers some of the negative impacts of residential noise and crowding (e.g. lack of jurisdiction over space which may lead to feelings of helplessness) (Wachs & Gruen, 1982),
- Poor air quality was associated with ‘sick building syndrome’, as individuals continually breathe recycled air or do not get sufficient fresh air, which can lead to increased psychological stress (Jukes, 2000, as cited in McCoy, 2002);
- Noisy work environment can be associated with stress, anxiety (Cohen, 1969; Kryter, 1972; Kahn, 1981; Menaghan & Merves, 1984; Norbeck, 1985; Kasl, 1992; Bayo et al., 1995; Barreto et al., 1997; Akerstert & Landstrom, 1998; Ahasan et al., 1999)

### ***2.3. The psychological impact of the physical and ambient environment***

The psychological impact of the physical and ambient environment is related to our perceptions of density and crowding, sense of safety and fear and way-finding (Cooper et al., 2008). Studies in this area include:

- Crowding is believed to have substantial negative effects on social relations (Baum & Paulus, 1987);
- Crowding is believed to have substantial negative effects on psychological health (Gove & Hughes, 1982; Baum & Paulus, 1987; Gabe & Williams, 1987; Evans et al., 1989; Edwards et al., 1990; Lepore et al., 1991);
- Density is related to social interactions within University environments (Baum & Valins, 1977; Karlin et al., 1978; Baum & Davis, 1980).

## **3. The Physical Environment: Current Trends and Drivers**

There are several ways in which the physical environment is evolving. For instance, new materials and designs, migration and exodus are factors constantly (re) shaping the physical environment characterisation. From time to time, a new set of trends emerge and it is import to picture what is happening in the environment so that any necessary interventions to mitigate or accelerate impacts can be put in place. The list below presents a summary of the discussion related to 10 UK trends associated with the reconfiguration of the physical environment (more information can be found at Cooper et al. 2008). No particular order is used to present the trends and to facilitate reading, the investigated environments, which include dwellings, neighbourhoods, urban/rural spaces, natural spaces, educational settings, workplaces, healthcare settings are referred as the physical environment.

- **Short-termism:** refers to the focus of the government and the private sector on achieving short-term gains, rather than delivering long-term benefits. Relevant changes to, and impacts on, wellbeing are measured and achieved only after a short period of time has passed. Positive impacts on wellbeing are related to the alleviation of stressor factors through the provision of immediate solutions (e.g. new schools, hospitals, housing) according to demand. Negative impacts may emerge in the long-term as quantitative and qualitative changes in demographics may not be appropriately considered within immediate solutions. For instance, a mortgaged future may occur, particularly due to the procurement process.
- **Zero Carbon:** refers to the adoption of changes to the physical environment to support the reduction of the current worldwide levels of carbon use per person. Environmental issues such as air and water pollution have a direct impact on wellbeing. Positive impacts on wellbeing associated to the improvement of the quality of the ambient environment (e.g. resulting from the use of alternative sources of energy – such as solar, wind, waves – therefore lessening pollution levels). Negative impacts on wellbeing will continuously occur if we fail to reduce the levels of CO<sub>2</sub> emission.
- **Increased Density in the Urban Environment:** an increase in the number of individuals living in cities and the simultaneous reduction of square metres occupied per individual. Geographically concentrated emissions of CO<sub>2</sub> can facilitate the monitoring and the implementation of counter measures to tackle environmental issues. Consequently, a possible reduction of environmental degradation of rural and natural spaces which are essential to our wellbeing. Increased environmental pollution due to agglomeration of people (noisier environments, greater volumes of pollution to deal with) resulting in the distortion of our perceptions of density and crowding, sense of safety and fear and panic, therefore decreasing wellbeing.
- **Increasing Polarisation:** increasing social, economical and cultural segregation due to changes in demographics, income inequality, market fluctuations, economic displacements, ‘virtualisation’ of work and leisure activities etc. Positive impacts on wellbeing due to polarisation can be associated with increased opportunities for a multicultural society, which would celebrate different cultures and faiths without losing native identities. Wellbeing can be negatively affected if conflicts due to cultural and economical differences occur, which may result in social segregation, gentrification of the inner city and the formation of ghettos.
- **Commercialism and Mono-functionalism within the Physical Environment:** an increasingly materialistic and commerce-based society where building functions, urban blocks, and even open public spaces are used for single purposes. Increased commercialism may increase competition which may

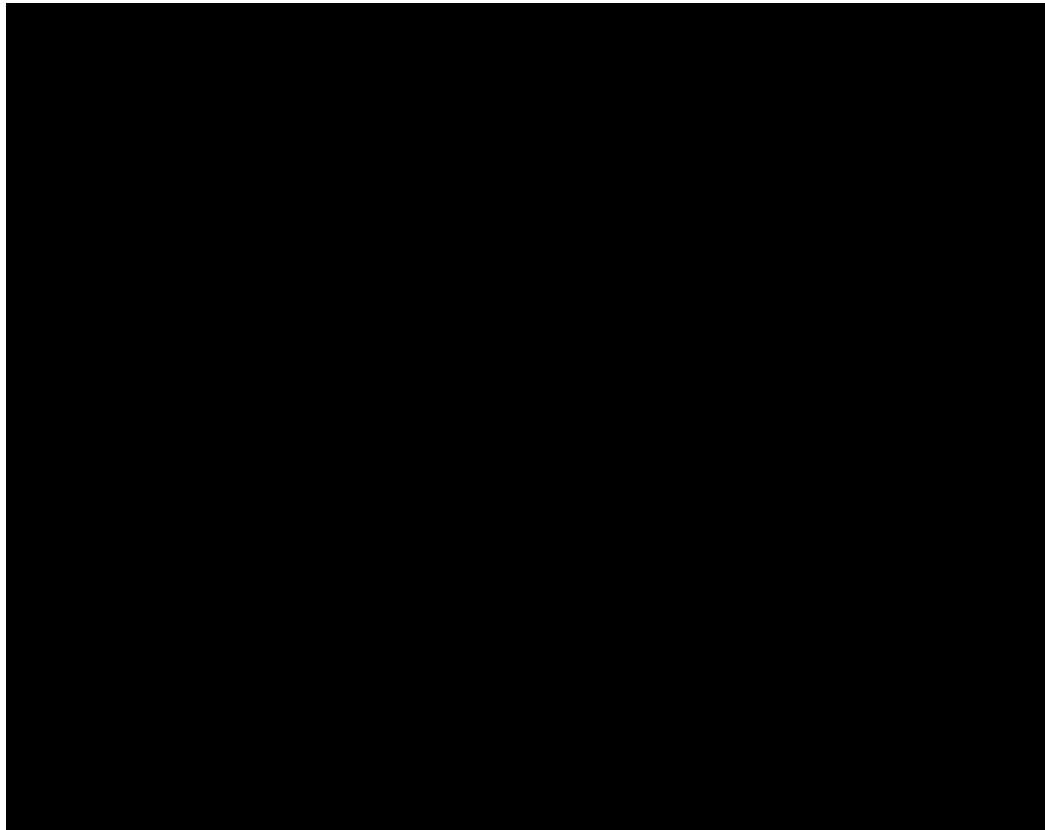
impact positively in the quality of services (e.g. better, faster, and cheaper) as well as in the provision of more choices for consumers. Increased privatisation of public spaces and consequent reduction of community access and freedom to use the physical environment in the way individuals want.

- **Ubiquitous Technological Environments:** The growing presence of (digital) technologies in our daily lives (e.g. mobile telephones, high-tech services) and the increasing variety of physical environments in which we find, use and react to technology as well as interact with it. With increased -ubiquitous technological environments it is likely that we will have more technology embedded in the environment in which we live, therefore increasing the possibility of enhancing, for example, learning, diagnosis and treatments and communication. Negative impacts on wellbeing due to ubiquitous technological environments can be associated with the fact that we will not be physically exerting ourselves, therefore potentially contributing to obesity, sedentary life-style and other physical health-related diseases.
- **Engineering Quality Out:** An increasing emphasis on quantity and tangibility to the detriment of the quality of physical environments and its significant and valuable intangible components. Engineering quality out may impact negatively on wellbeing as subjective and intangible characteristics of the physical environment (e.g. art and aesthetics) are neglected creating spaces which are meaningless and without soul/identity. This trend also opposes zero-carbon as it stimulates the formation of more dischargeable environments. No positive impact was identified / inferred in engineering quality out.
- **Virtual social communities:** An increasing formation of virtual social communities and the reduction of 'real' social communities, leading to less physical and face-to-face interaction. The formation of virtual social communities may impact positively on wellbeing as they stimulate new and diverse groups of people from all across the world to interact. For instance, more groups supporting learning and social care can be created. However, the increase of virtual social communities may negatively impact on wellbeing as contact face-to-face may be reduced and accessibility to those virtual communities can be an issue for those who cannot afford IT.
- **Mitigation of Risk and 'Dumbing Down' of Physical Environments:** Continuing to move toward a nanny state and a health-and-safety society, leading to a lack of exposure to risks necessary for independent action and growth. Interventions in the physical environment could take place to make spaces "safer" for users by reducing the risks of using the environment. However, within the physical environment, the interventions may result in bland settings where people are not stimulated and are unable to explore their own limits and the limits of spaces.

- Surveillance: refers to an increasing observation of individuals and groups, particularly through digital technologies. Increased surveillance within the physical environment may positively impact on wellbeing by improving our perception of security and safety related to the physical and ambient environment. On the other hand, our perception related to privacy may be reduced impacting negatively on our wellbeing.

The identified trends and their impacts on wellbeing as related to the physical environment framework are presented in Table 1.

Table 1. Trends within the physical environment and its relationships with wellbeing (Source: Cooper et al., 2008).



#### **4. Discussion**

Evidence gathered in this research shows that the physical environment can have both positive and negative impacts on wellbeing. In this respect, wellbeing is influenced by what we see, smell, touch, taste and hear, as well as by how we perceive and interpret the surrounding environment. That is to say that wellbeing, to a considerable extent, is dependent on individuals' ontology. However, it does not mean that



standards and patterns of behaviour – which applies to larger groups of people - cannot be found. They can and those presented here emerged (mainly) from studies conducted in the UK, therefore reflecting the context of its society.

Although the proposed methodology helped the researchers to gain a better overall view of the interdisciplinary area of the physical environment and wellbeing, as the review progressed, three general limitations emerged:

- The review has shown that direct cause and effect relationships (such as ‘poor lighting leads to poor mental health’) are not always supported. Rather, mediating and moderating variables can be used to explain the complex, non-linear and indirect relationship between the physical environment and mental capital and wellbeing. Thus, poor lighting, little communal space for social interaction and a prior history of mental illness predicts poor mental health. Further research undertaken should take account of this intricate relationship and more fully explore the importance of intervening variables.
- Despite the considerable amount of research literature available on the impacts of the physical environment on wellbeing, the results still cannot be consolidated. The current sparseness of the research field and the limitations of existing studies indicate that there are far too many possible design variations and combinations to expect that any great proportion of them may be tested experimentally. An additional reason is that the interface of person and the physical environment in real situations may be simply too complex to capture in linear, experimentally controlled tests within diverse settings (Lawton, 2001).
- Finally, little research has been undertaken on future issues. Additional work should be conducted to understand what future issues will arise that may influence the relationship between the physical environment and mental capital and wellbeing.

## **5. Conclusions**

The role of the physical environment in relation to improving our wellbeing is key. Therefore, the major objective of this research was to identify evidence that the physical environment impacts on wellbeing and to relate the evidence to current trends in the physical environment aiming at exploring future scenarios. The research involved an extensive literature review and the realisation of a workshop with UK experts. This paper has set out scientific evidence demonstrating that the physical environment does, indeed, impact on mental wellbeing. Evidence of the impact of the physical environment on wellbeing was grouped according to the quality of the fabric of the built environment, the quality of the ambient environment and psychological impacts of the physical and ambient environment. The literature review demonstrates

that the physical environment impacts directly and indirectly in our wellbeing. The physical environment can directly impact positively and negatively on our physical and psychological health whilst indirectly it can shape or induce the way we behave as individuals and/or society. Future trends were also identified that indicate how our cities and the people living in them will change over the next several decades. In order to ensure long-term wellbeing, it is critical, therefore, that we address both the evidence and the trends and devise interventions that will help all segments of society.

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